

Appl. No. 09/839,365
Amendment dated: October 9, 2003
Reply to OA of: July 11, 2003

REMARKS

Applicants have amended the claims in order to more particularly define the invention taking into consideration the outstanding Official Action. Claims 1 and 13 have been amended to more particularly define the invention and distinguish over the prior art. These claims have been amended to specify the forming of the contact window in both the over coating layer and the coating layer is by a single isotropic etching process, wherein upper part of said contact window is outwardly widened as fully supported by Applicants' specification. See the paragraph bridging pages 8 and 9 and the applicable figures of the drawings.

Claim 20 has been canceled from the application without prejudice or disclaimer. The claims now remaining in the application are claims 1, 3-11 and 13-18. Applicants most respectfully submit that all the claims now present in the application are in full compliance with 35 U.S.C. §112 and are clearly patentable over the references of record.

The rejection of claim 20 under 35 U.S.C. §112, first and second paragraphs, has been carefully considered. It is believed that claim 20 complies with the statute but in an effort to reduce the issues, either for appeal and/or early allowance, this claim has been canceled from the application. In view of the cancellation to claim 20, the objection and rejections of this claimed are believed to be obviated and it is most respectfully requested that these objections and rejections be withdrawn. The only remaining issue is the patentability of the claimed invention over the prior art.

Each rejection of claims 1 and 3-11 under 35 U.S.C. §102(a) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Akram et al. has been carefully considered but is most respectfully traversed as is the rejection of claims 13-18 and 20 under 35 U.S.C. §103(a) as being unpatentable over Akram et al.

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With respect to the anticipation rejection, Applicants wish to direct the Examiner's attention to MPEP § 2131 which states that to anticipate a claim, the reference must teach every element of the claim.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed Cir. 1989). The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed.Cir. 1990).

Where in the reference is all of the limitations now set forth in the claims now present in the application? Accordingly, it is most respectfully requested that the anticipation rejection be withdrawn in view of the further amendments to the claims.

Applicants wish to direct the Examiner's attention to the basic requirements of a prima facie case of obviousness as set forth in the MPEP § 2143. This section states that to establish a prima facie case of obviousness, three basic criteria first must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Section 2143.03 states that all claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art."

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In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Applicants also most respectfully direct the Examiner's attention to MPEP § 2144.08 (page 2100-114) wherein it is stated that Office personnel should consider all rebuttal argument and evidence present by applicant and the citation of In re Soni for error in not considering evidence presented in the specification.

The obviousness rejections are respectfully traversed on the basis that the proposed modification of Akram et al. would render the teaching of Akram unsatisfactory for its intended purposes and change the principle of operation of Akram being modified, and thus there is no suggestion or motivation to make the proposed modification. Thus the teaching of Akram et al. is insufficient to render the claimed invention unpatentable.

Particularly, Akram discloses a semiconductor processing method of forming a contact opening therein. The method includes providing a substrate having a node location to which electrical connection is to be made. A layer comprising doped silicon dioxide is formed over the node location. Thereafter, both O₂ and O₃ are flowed simultaneously to the substrate along with tetraethylorthosilicate to the substrate to form a continuous layer comprising undoped silicon dioxide on the layer comprising doped silicon dioxide. During the flowing, a ratio of O₃ to O₂ flows is increased to form an outer portion of the continuous layer comprising undoped silicon dioxide to have a higher etch rate for a selected wet etch chemistry than an inner portion of said continuous layer. A common contact opening is anisotropically dry etched into the layer comprising undoped silicon dioxide and into the layer comprising doped silicon dioxide over the node location to outwardly expose the node location. After this etching, a subsequent wet etching with the selected chemistry is conducted within the common contact opening to widen the contact opening in the outer portion of the layer comprising undoped silicon dioxide as compared to the inner portion of the layer comprising undoped silicon dioxide. The subsequent wet etching is chosen and conducted to be

effectively selective to not substantially laterally etch the layer comprising doped silicon dioxide.

It is quite clear that Akram teaches a layer comprising doped silicon dioxide over the node location and a continuous layer comprising undoped silicon dioxide on the layer comprising doped silicon dioxide. The continuous layer is formed by flowing both O_2 and O_3 simultaneously to the substrate along with tetraethylorthosilicate to the substrate. The continuous layer thus has an outer portion having a higher etch rate for a selected wet etch chemistry than an inner portion of the continuous layer. The etch rate throughout the continuous layer varies with the thickness of the continuous layer for a selected wet etch chemistry. The continuous layer is formed by a single process and it is a singular layer. The differing etch rates are formed as a result of varying precursor flow during the deposition of the continuous layer.

Moreover, the contact openings 44a and 46b of Akram are formed by two separate etching processes. As shown in FIG. 4, a first etching is performed to produce the illustrated respective common contact openings 44 and 46 into outer portion 40 and inner portion 42 of first insulating layer 38 over respective node locations 32 and 34, and into first insulating layer 36. The contact openings 44 and 46 as initially etched will have their respective same open widths 47 and 49, respectively, in outer portion 40 of insulating dielectric layer 38 as in inner portion 42 of insulating dielectric layer 38. Further, such first etching is preferably conducted completely to outwardly expose the respective node locations 32 and 34, as shown.

Then as shown in FIG. 5, after the first etching, layers 38 and 36 are second etched using the selected chemistry to produce modified respective common contact openings 44a and 46a, with such having respective wider open widths 47a and 49a in outer portion 40 than in inner portion 42 after such second etching. The higher etch rate of the outer layer utilizing the above example chemistry, which is also higher in degree of isotropy in the etching, effectively produces the widened outer contact openings. The etch chemistry must be chosen such that no substantial lateral or isotropic etching occurs relative to that portion of contact openings 44 and 46 passing

through first insulating layer 36. The wider open widths 47a and 49a in outer portion 40 of the contact openings 44a and 46a are formed by a second etching process which can not etch the layer 36 and the node locations 32 and 34 simultaneously. The first etching process actually dose not form the wider open widths 47a and 49a in outer portion 40.

It is therefore that the proposed modification of Akram et al. would render the teaching of Akram unsatisfactory for its intended purposes and change the principle of operation of Akram being modified, and therefore there is no suggestion or motivation to make the proposed modification. The wider open widths 47a and 49a in outer portion 40 of the layer 38 are not formed by a first chemistry of the first etching process as shown in FIG. 4 although the contact openings 44a and 46a of Akram are formed by the first chemistry of the first etching process. The wider open widths 47a and 49a in outer portion 40 of the layer 38 result from the second etching process which can not etch the layer 36, the node locations 32 and 34.

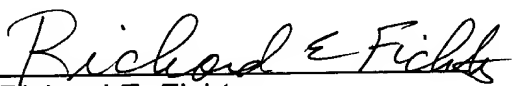
Applicants wish to further point out that Akram actually does not teach whether the etching rate of the layer 38 is larger or smaller than the etching rate of the layer 36. Akram only teaches that the layer 38 which is designated as the over coating layer by the Examiner will be etched by a selected chemistry of the second etching process while the layer 36 which is designated as the coating layer by the Examiner will not be etched by the same selected chemistry of the second etching process. The contact openings 44a and 46a of Akram must be formed by two separate etching processes which use two different etching chemistries respectively according to the intended purposes and the principle of operation of Akram. Thus the teaching of Akram et al. is insufficient to render the claimed invention unpatentable. Accordingly, it is most respectfully requested that these rejections be withdrawn.

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In view of the above comments and further amendments to the claims, favorable reconsideration and allowance of all of the claims now present in the application are most respectfully requested.

Respectfully submitted,

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REF:kdd
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October 9, 2003